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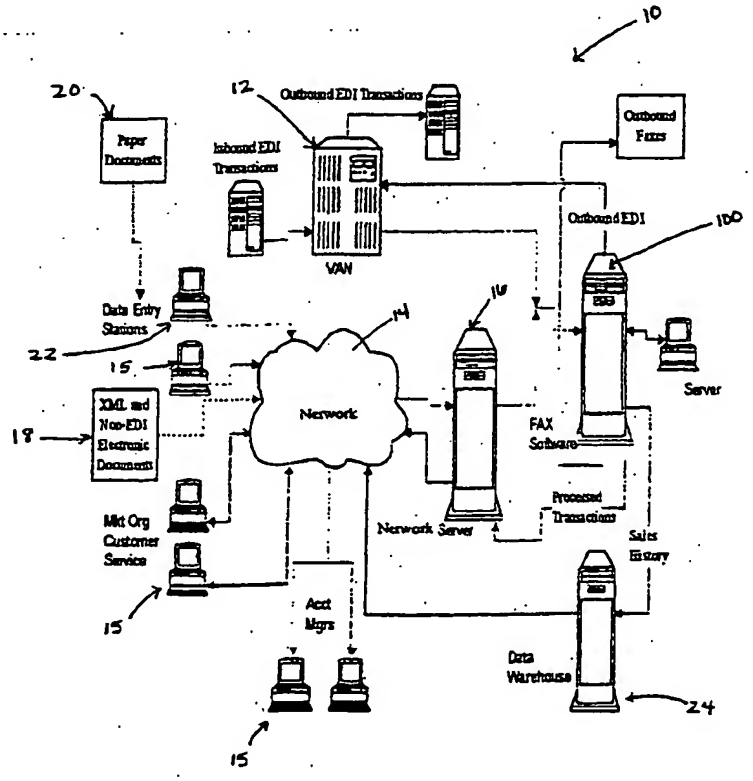
(54) Title: SYSTEM AND METHOD FOR PROCESSING DOCUMENTS



(57) Abstract: An electronic document processing system and a method for processing electronic documents between trading partners for a transaction is described. The system includes a comprehensive database that contains all the information necessary to process a purchase order, invoice, or other similar document. The system includes a validation portion that checks the information in the electronic document with the information in the database. The system also includes an outbound processing portion of converting the electronic document into a format required by the receiving trading partner. Information for the outbound processing is also contained in the database. A document sending portion is also included for sending the outbound document to the receiving trading partner.

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SYSTEM AND METHOD FOR PROCESSING DOCUMENTS

The present application claims priority to U.S. Provisional Application No. 60/145,871 filed July 27, 1999 herein incorporated by reference in its entirety.

Field of the Invention

The present invention relates generally to a system for processing documents such as purchase orders and invoices between trading partners.

Summary of the Invention

The present invention includes a method for processing documents between trading partners. The method includes receiving an electronic document from a first trading partner into a document processing system having a database that contains database trading information for the trading partners, wherein the document contains transaction specific information. The method further includes validating the transaction specific information with the database trading information and creating an outbound document for sending to the second trading partner using the database trading information contained in the database. Still further, the method includes sending the outbound document to the second trading partner.

The method of the present invention may also include the step of determining if the structure of the document can be read by the document processing system. The electronic document may be an EDI document, an XML document, or a non-EDI document. The outbound document may be selected from the group consisting of an EDI document, an XML document, a non-EDI document, and a facsimile document.

The method of the present invention includes an electronic document that is a purchase order or an invoice. Still further, the electronic document may be received from a network of computers or from a value added network.

Still further, the method includes recording each transaction in the database.

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The method may include an electronic document that contains purchase order information for purchasing at least one product from the second trading partner and the database contains product information for the second trading partner, the step of validating the transaction specific information further comprising comparing the purchase order information for each product with the product information.

The present invention also includes a system for processing an electronic document between trading partners that contains transaction specific information. The system comprises a document receiving portion for receiving the electronic document from a first trading partner; a database that comprises, document structure information, database trading information for each trading partner, and outbound document information for each trading partner; a document structure validation portion for comparing the document structure with document structure information contained in the database; a document processing portion configured to compare the transaction specific information in the electronic document with the database trading information for each trading partner; an outbound processing portion that creates an outbound document using the outbound document information for sending to a second trading partner; and a document sending portion adapted to send the outbound document to the second trading partner.

Further, the database may include database portions comprising a trading partner profile for each trading partner; a product listing portion that contains information for each product for each trading partner; a transmission queue defaults table; a promotional information portion for each product for each trading partner; a buying points portion that contains rules for governing a transaction between the trading partners; and an authorized product portion that contain a listing of authorized

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products for each trading partner; and wherein each of the database portions are in electronic communication with the document processing system.

The document receiving portion may include an EDI receiving portion having an EDI input for receiving an EDI document and a network document receiving portion having a network document input for receiving a network document.

The document sending portion may further include an EDI sending portion having an EDI output for sending an EDI document and a network document sending portion having a network document output for sending a network document, and a facsimile sending portion having a facsimile sending output for sending facsimile documents.

Still further, the system may further include a database maintenance portion for updating the database.

The network document receiving portion of the system may be connected to the internet.

The present invention also includes a method for updating information in a record in a database in a document processing system comprising receiving a database maintenance electronic document from a trading partner into the document processing system, wherein the document contains database record update information for the trading partner; finding the record for updating; comparing the record update information with the information in the record; and updating the record with the record update information. The record update information may be adding a new record or deleting an existing record.

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Brief Description of the Drawings

Figure 1 is a diagram illustrating a global view of a system that includes a document processing system in accordance with an embodiment of the present invention.

Figure 2 is a diagram of the document processing system shown in Figure 1.

Figure 3 is a diagram of a database for the document processing system shown in Figure 2.

Figure 4 is a diagram of an overview of a document processing system in accordance with one embodiment of the present invention.

Figure 5 is a diagram of a document structure validation system for the document processing system shown in Figure 4.

Figures 6a and 6b are diagrams for a purchase order validation system for the document processing system shown in Figure 4.

Figures 7a and 7b are diagrams for an invoice validation system for the document processing system shown in Figure 4.

Figure 8 is a diagram for a database maintenance validation system for the document processing system shown in Figure 4.

Figure 9 is a diagram for an outbound document processing system for the document processing system shown in Figure 4.

Detailed Description of the Preferred Embodiment

The present invention generally relates to processing documents for a transaction between two parties. The parties to the transaction are hereafter referred to as trading partners. The type of documents that may be processed include purchase orders, invoices, database maintenance documents, and other documents used in a transaction between trading partners. More particularly, the present invention is

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applicable to trading partners in industries that buy and sell products, supplies, materials, or goods through a supply chain. Trading partners include, but are not limited to, customers, retailers, wholesalers, distributors, suppliers, sales and marketing organizations, manufacturers, and shipping companies.

While the invention is applicable to a wide range of industries, the invention will be described in the context of the consumer package goods industry. Typically, in the consumer package goods industry, as well as other industries, manufacturers either appoint sales and marketing organizations to represent them in specific geographical markets or they act as their own sales and marketing organization. One sales and marketing organization may represent more than a thousand different manufacturers. The sales and marketing organizations and manufacturers traditionally use in-house computer systems to provide a variety of services. These services include (1) sales and marketing to customers such as retailers, wholesalers, and distributors; (2) retail store checking; (3) foodservice operator calls; (4) entry, expediting, and validating purchase order data received from the customers for the product to be supplied by the manufacturer; (5) resolving price and promotional discrepancies between the customers' purchase order and the manufacturers' published pricing; (6) maintaining manufacturers' product and promotional information on their individual database; and (7) keeping customers up to date on promotions, new items, and price changes.

When each sales and marketing organization or manufacturer is handling these services, it results in an inefficient process. There are many different computer systems maintaining separate databases. Paper purchase orders have to be entered and validated by a customer service representative where the representative is visually checking each item, price, and promotion for eligibility. The representative is

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makings changes to the order based on their knowledge of the relationship with the customer. In order to process electronic data interchange ("EDI") document purchase orders, each order processing computer requires EDI translation software and results in value added network ("VAN") charges. Many individual computer systems are unable to handle individual customer's non-standard EDI elements. Further, the EDI purchase orders typically have to be checked by a customer service representative. In the case of a sales and marketing organization the order still has to be forwarded to the manufacturer which requires additional computers and EDI translation software and results in additional VAN charges. For non-EDI capable manufacturers the order has to be faxed to the manufacturer.

Shipment tracking by the customer and manufacturer is also inefficient. The customer typically has to call the marketing organization for shipment status of an order. The representative for the marketing organization calls the manufacturer. The manufacturer calls the trucking company. The manufacturer then advises the marketing organization. The marketing organization then advises the customer.

The present invention centralizes the processing of orders, invoices, the exchange of product and promotional information, and the providing of sales analysis to authorized users throughout the supply chain. This is accomplished by the use of an extensive database that contains all the relevant information about a trading partner and their relationship with other trading partners. The document processing system checks an order from a customer with information from the manufacturer that relates to that customer. The system is capable of evaluating various criteria relating to the transaction. For example, the system can evaluate whether a customer is authorized to purchase a particular product, the price for that customer, any required minimum amounts for that customer, and if there is a promotion the customer is eligible for.

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The result of the document processing system is that the orders are validated with minimal clerical intervention.

With reference now to Fig. 1, there is shown a global view of a system 10 that includes a document processing system 100 in accordance with an embodiment of the present invention. Briefly, the document processing system 100 is capable of sending and receiving EDI documents through a value added network ("VAN") 12. Further, the document processing system 100 is connected to a computer network 14 by way of a network server 16. The network 14 may include one or more computers 15 in electronic communication with one another, the Internet, the Intranet, or any other network in which one or more computers and electronic communication with one another. Non-EDI electronic documents and XML documents 18 enter the document processing system 100 through the network 14 and the network server 16. Paper documents 20 may be placed into electronic form through a data entry station 22 in which the data entry station transmits the information in the paper document to the network 14 at which time it is then forwarded to the network server 16 and enters the document processing system 100.

It will be appreciated that any trading partner that has access to the network of computers will be able to submit documents for processing. A data warehouse 24 stores the transaction history and information regarding the processing of the documents. This information may be posted to the network.

With reference now to Fig. 2, there show a diagram for a document processing system 100 in accordance with an embodiment of the present invention. The system 100 includes an EDI document receiving portion 110 that has an EDI input 112 for receiving an EDI document from the VAN 12. The system 100 also includes a network document-receiving portion 114 that includes a document input 116 for

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receiving network documents from the network server 16. Alternatively, the document receiving portion may be configured to directly receive document from the network.

The system 100 includes a document structure validation portion 118, a purchase order-processing portion 120, an invoice processing portion 122, a database maintenance portion 124, a database portion 126, and an outbound processing portion 127. Also included in the system 100 is an EDI sending portion 128 that has an EDI output 130 for sending EDI documents to the VAN 12. A network sending portion 132 having a network output 134 for sending network documents to the network server 16 for posting to the network 14 is also included in the system 100. Alternatively, the network sending portion may be configured to send documents directly to the network. Further the output may also be configured to send documents to the data entry station 22. Still further, a facsimile sending portion 136 having a facsimile output 138 for sending facsimile documents may also be included in the system 100.

Each of the above parts of the system 100 are connected by a data bus 102 which may also be connected with other systems.

The Document Processing System Database

The document processing system 100 relies upon the database portion 126 for information about the trading partners when processing a purchase order or invoice. The database is extensive and contains information regarding the relationship between trading partners. The database 126 contains enough information to process a purchase order, invoice or other similar document with only a minimal amount of clerical intervention, if any at all.

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An exemplary database 126 for the document processing system 100 is shown in Fig. 3. The database 126 contains trading partner profiles 140. Each trading partner, including but not limited to, a customer, manufacturer, distributor, supplier, or shipper, may have unique methods and requirements for sending purchase orders and other documents, as well as unique requirements for receiving them. The database 126 includes information used for automating the transmission process in the trading partner profile 140 for each trading partner. The trading partner profile contains detailed information for both inbound and outbound transmissions, all EDI and XML codes and identifications necessary for validating the structure and content of the document, EDI and facsimile formatting specifications, any customized rules and options for transacting business with the trading partner.

The database 126 may also contain transmission queue defaults 142. Each buyer and seller relationship (buying point) may have one or more methods by which documents are to be transmitted. The document processing system 100 uses the transmission queue defaults portion 142 and any other information necessary in the database 126 to automatically queue up each transaction as required. Marketing organization profiles 144 may also be included in the database 126. These profiles would contain information such as names and addresses of the organization and the marketing organization group identification number or tag.

The database 126 may also contain a supplier profile portion 146. This profile 146 would include information such as addresses and contact, shipping methods and instructions, pricing methods, market area and product classifications, sales and marketing organization, and commission calculation methods and rates.

The database 126 also includes a product-listing portion 148. The product-listing portion 148 preferably contains every product sold by every manufacturer.

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The product-listing portion 148 may contain information regarding the description, packaging and dimensions of the product. Further, the products listing portion 148 would preferably contain UPC and other identification numbers for the products. Product classifications, ordering, pricing and tracking units including factors for converting from one unit to another may also be included in the product listing 148. Preferably, past, current and future prices are also maintained in the product-listing portion 148.

The database 126 also contains customer profiles 150. These profiles include information about the customer, such as bill-to information, ship-to locations and delivery instructions.

The database 126 may also contain information on promotions for a product in a product promotion portion 152. The document processing system 100 allows promotional data to be customized according to customer and by product. Promotional information may include, but is not limited to, date eligibility, customer eligibility, product eligibility, allowance types and amounts, minimum and maximum quantities (case caps) allowed, any special conditions, other pertinent promotional data.

The database 126 may also contain a buying point's portion 154. The buying points portion 154 contains information and data about the relationship between a particular buyer and seller and may include such information as pricing, the terms of the transactions, manufacturer designations (market areas, regions, etc.), and specific business rules and overrides.

In a preferred embodiment, the database 126 may contain an authorized product portion 156 that contains a table of authorized products. The table contains

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all of the products that each customer buys and includes information such as customer warehouse codes, authorization and discontinue dates and suggested retail prices.

The database 126 also includes a purchase order and invoice transaction portion 150 that contains information such as order header data, order detail or product data, promotion details, notes, comments, shipping instructions, and inbound EDI raw data.

Further, the database 126 may contain several tables that contain information for automating the document processing system. These tables may include an EDI mapping table 160. The table 160 maps database fields to EDI segments according to trading partner-specified requirements. Further, a facsimile mapping table 162 may be included for mapping database fields to facsimile documents according to trading partner-specified requirements. Other tables such as a forms table portion 164 for generating trading partner specific forms may also be included. Further, the database may contain an XML document type definition ("DTD") portion 214 for parsing XML documents.

The database 126 may also include a history compilation portion 166 for compiling the transmission history for a transaction. The database 126 archives all outbound transmissions and includes information such as the date, time and status of the transmission. All of the portion of the database 126 are in communication with one another and with the rest of the document processing system by a database data bus 167.

The database may utilize a Progress ™ Relational Database. The database and software system may be written in Progress™ 4GL programming language. However, other suitable programming languages and database formats may be used.

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products are converted to the manufacturer's units at the convert customer units to manufacturer unit point 276. If the product identification number cannot be determined, an error is registered on the error log 240 in the database 126 and reported to the data entry station 22.

Once the units have been converted, the units are checked in a valid conversion gate 278. Upon successful unit conversion, the product information is sent to an authorized product gate 280. The authorized product gate 280 determines whether the product is authorized by the customer. Unauthorized products go to an override authorization gate 282 where the rejection can be overridden. In the event of an override, the database 126 is updated to add the product to the database at the add product point 284.

As shown in Fig. 7b, authorized products are sent to a totals and commission calculation point 286 where invoice totals and commissions are calculated, and any invoice-specific rules are applied. . The document then passes to a rules satisfied decision gate 288 where a document that has satisfied all the necessary rules listed in the database 126 is sent to the purchase order matching gate 292. If all the rules were not satisfied, the document is forwarded to an override authorization gate 290 where the rules may be overridden. If not, an error is recorded in the error log 240 and reported to the data entry station 22.

Once all the rules have either been satisfied or overridden, the invoice is sent to an invoice and purchase order matching gate 292. If an invoice matches an un-invoiced purchase order, the purchase order data is replaced with the invoice data at the replacement point 294. The database 126 is updated to reflect the new invoice information. If the invoice does not match an unvoiced purchase order, the document is sent to a purchase order origination decision gate 296. If the manufacturer's

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purchase orders are not normally processed through the document processing system 100, the document is forwarded to create a new invoice order point 298 where a new invoiced order is created. If the manufacturer's order should have been processed through the document processing system 100, an error is reported in the error log 240.

Referring back to Figure 4, upon completion of the invoice validation, the document is sent to the XML document point 174 where an XML document reflecting the invoice and any errors is forwarded to the network 14 and the data entry station 22.

Database Maintenance Validation System

It is important that the database containing all the trading partner profiles be routinely updated and maintained properly. Incorrect information in the database will likely generate errors in the document processing system. The present invention may include a database maintenance validation system 124 where trading partners can update information in the database 126.

With reference now to Figure 8, a database maintenance validation system 124 in accordance with an embodiment of the present invention is shown. As with the purchase order validation system 120 and the invoice validation system 122, the database maintenance validation system 124 can process EDI, XML or non-EDI documents.

Maintenance documents that have the proper electronic structure go the database maintenance validation system 124. The maintenance document is forwarded to a maintenance type evaluation point 300 that determines the type of maintenance the document is purporting to accomplish. For example, changing manufacturer information, customer information, buying points, products,

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promotions, authorizing products, or representative categories will require updating the database.

Once the type of maintenance is determined, the document goes to a new record decision gate 302. If a new record is requested, the system checks to see if the record already exists at the existing record gate 304. Records that already exist generate an error and are recorded in the error log 240 and reported to the data entry station 22. If the record does not already exist, the document goes to a validation gate 306 where the information for the new record is validated and checked for invalid relationships. Upon successful validation, the database 126 is updated with a new record containing the updated information from update database point 308.

Maintenance document that do not require a new record are forwarded to an edit existing record gate 310 where documents that are intended to be edited are then forwarded to a record found decision gate 312. If no record is found, an error is registered in the error log 240 and reported to the data entry station 22. If the desired record is found, the document is forwarded to an editing validation gate 314 where the information in the maintenance document is validated. Upon successful validation, the database 126 is updated with the edited information from the update database point 308. If the record is not found or if the validation process generates errors, errors are recorded in the error log 240 and reported to the data entry station 22.

If the maintenance document is not editing an existing record or adding a new record, the document is forwarded to a delete existing record decision gate 316. Documents that are attempting to delete an existing record are passed to a record finding decision gate 318. When the record finding decision gate 318 finds the requested record, the document is sent to a validation gate 320 where the information in the maintenance document is validated and check against information contained in

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the database. Upon validation, the database 126 is updated with the maintenance information from the update database process point 308. If the record is not found or if the validation process generates errors, errors are recorded in the error log 240 and reported to the data entry station 22.

With reference back to Figure 4, if errors were generated in the database maintenance validation system 124, the document with the errors is forwarded to the XML document point 174 which is forwarded to the data entry station 22 for review and release over the network.

Error-free maintenance documents are reported to the data entry station 22 or review point for approval. Upon approval, the database126 is updated.

Outbound Document Processing System

Once the structure and content of the inbound document has been validated, the document is forwarded the outbound document processing system 127.

With reference now to Figure 9, there is shown an outbound document processing system in accordance with an embodiment of the present invention. The document passes to an error decision gate 322. If there were errors in the invoice or purchase order validation process, the document is converted to an XML document with the error messages using information from the database 126 and the error log 240 at the generate XML document with error messages point 324. The XML document with the error messages is then forwarded to the sending trading partner.

Error free documents are sent to an outbound requirement generator 326 that uses information in the transmission queued default table 142 to determine what form the outbound document should take. The document is then forwarded to an EDI decision gate 328. If the outbound requirement for the manufacturer is for an EDI document, an EDI document is generated at the EDI document transaction point 330.

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Fig. 1

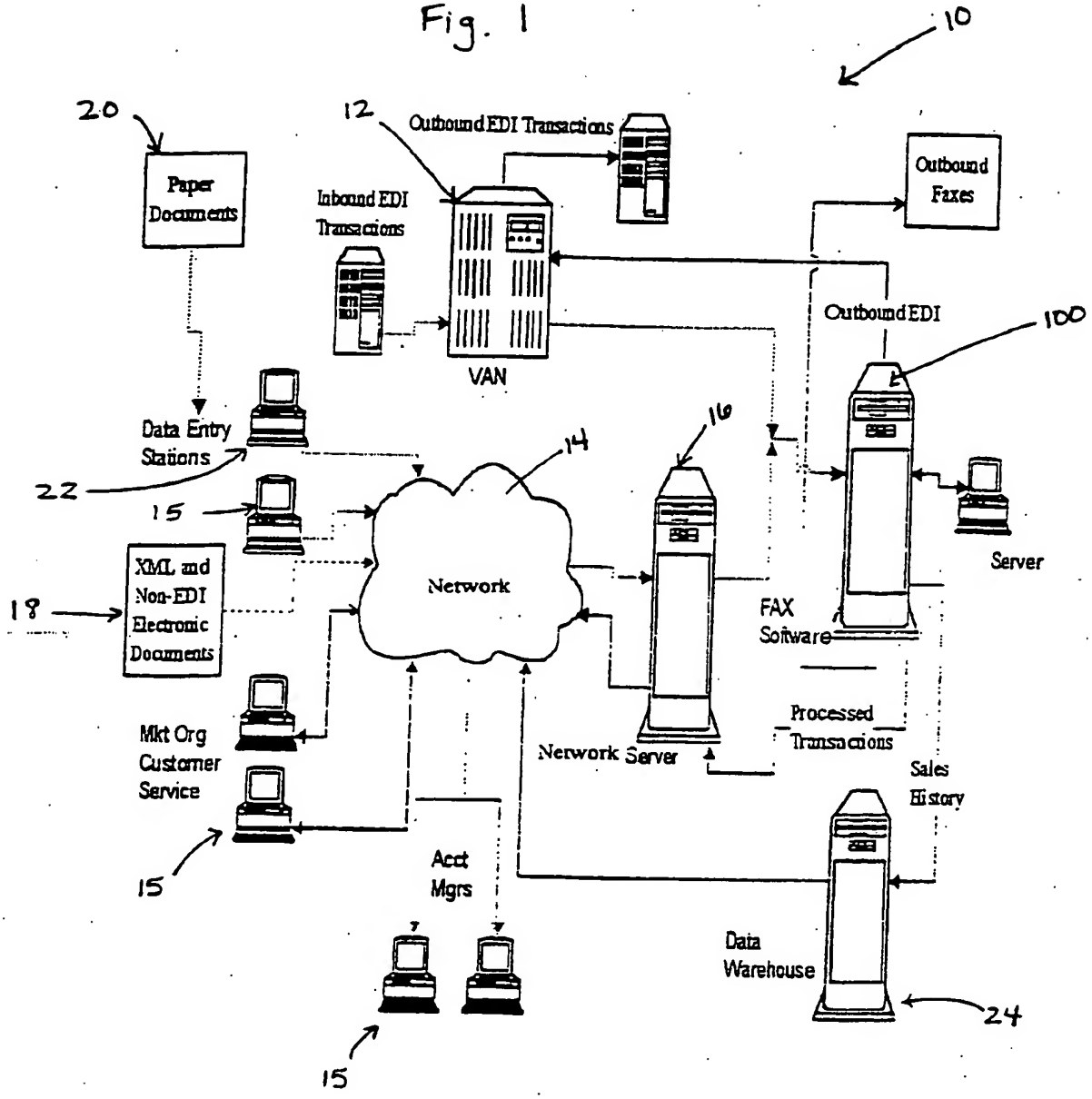

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Fig. 4

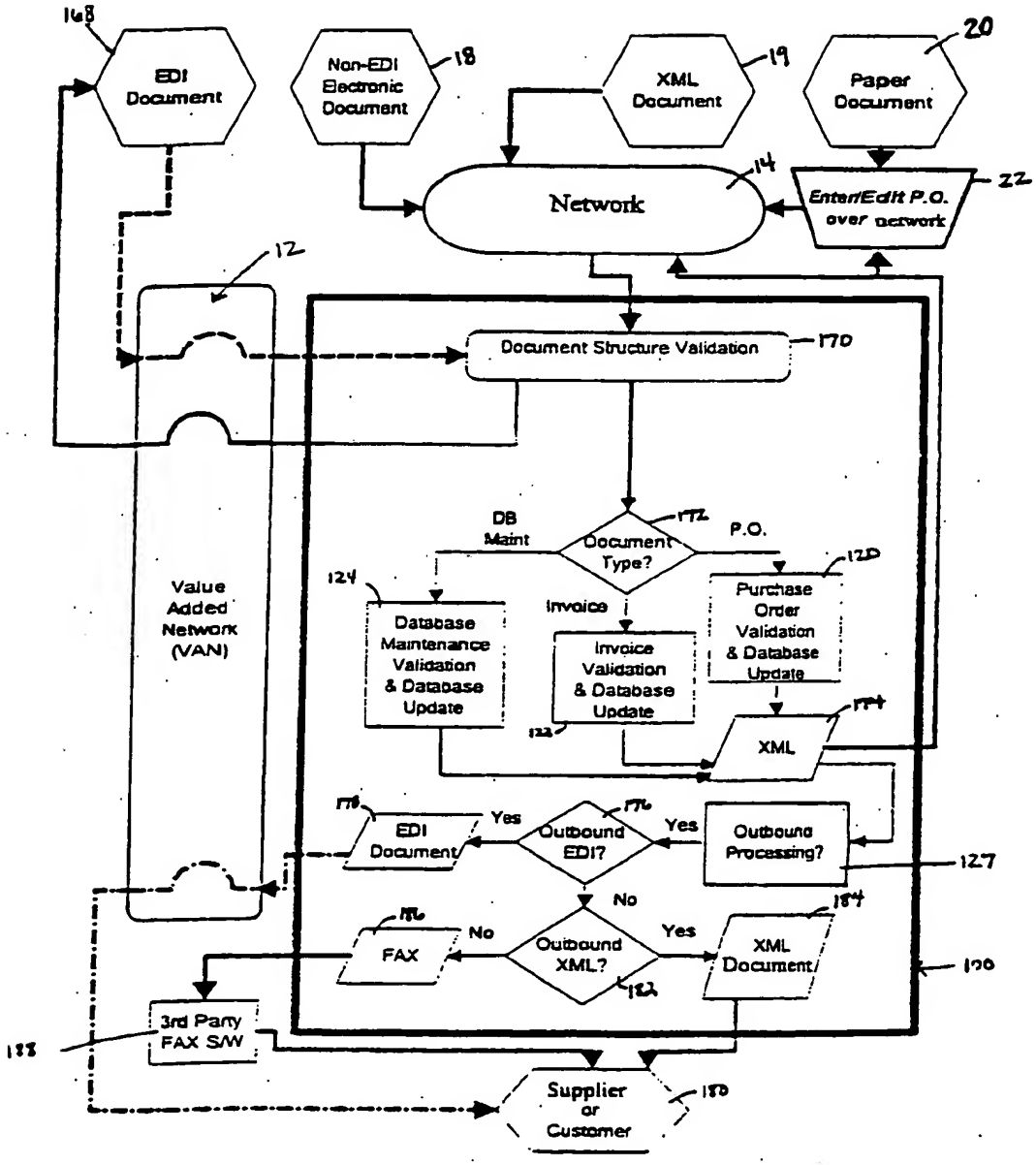

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Fig. 8

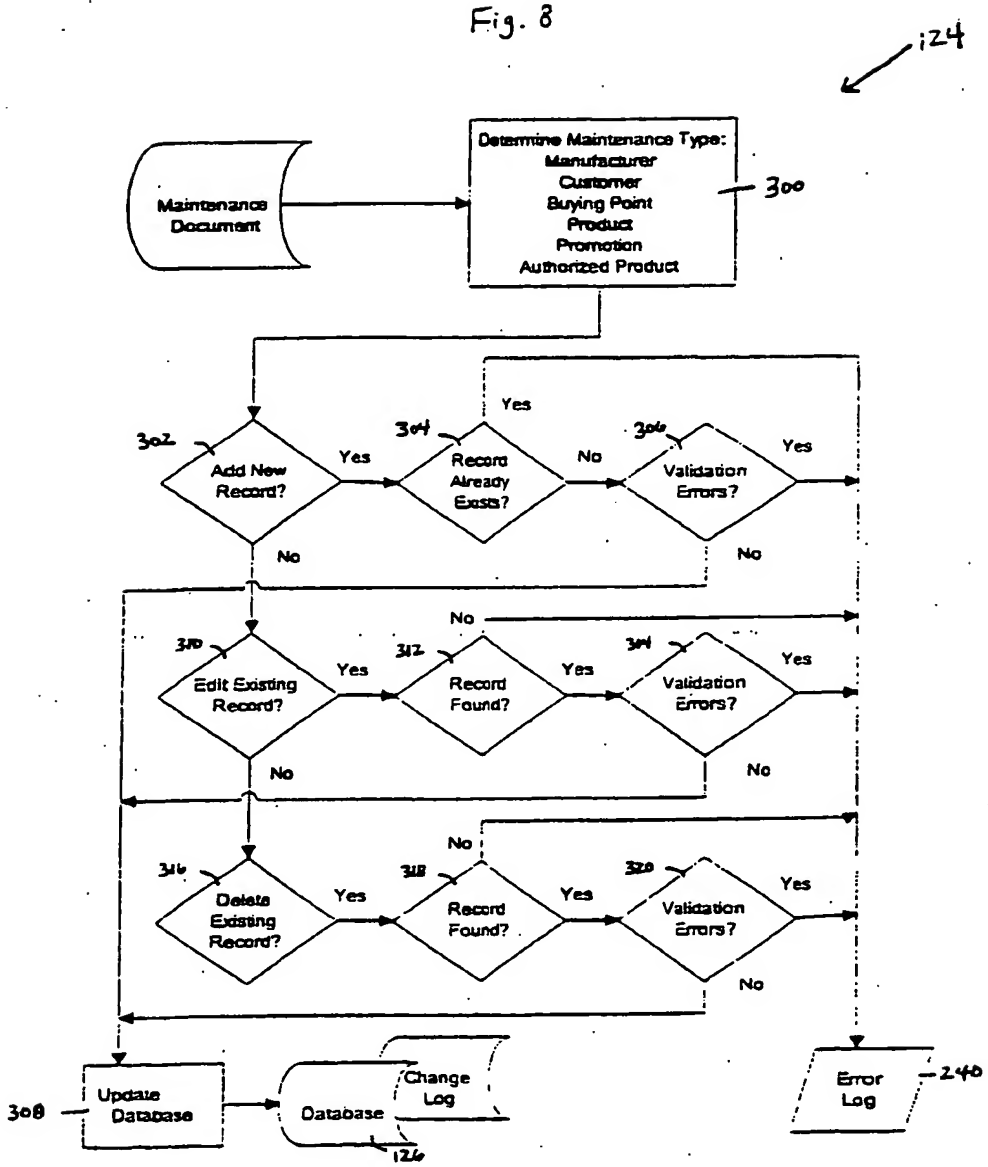

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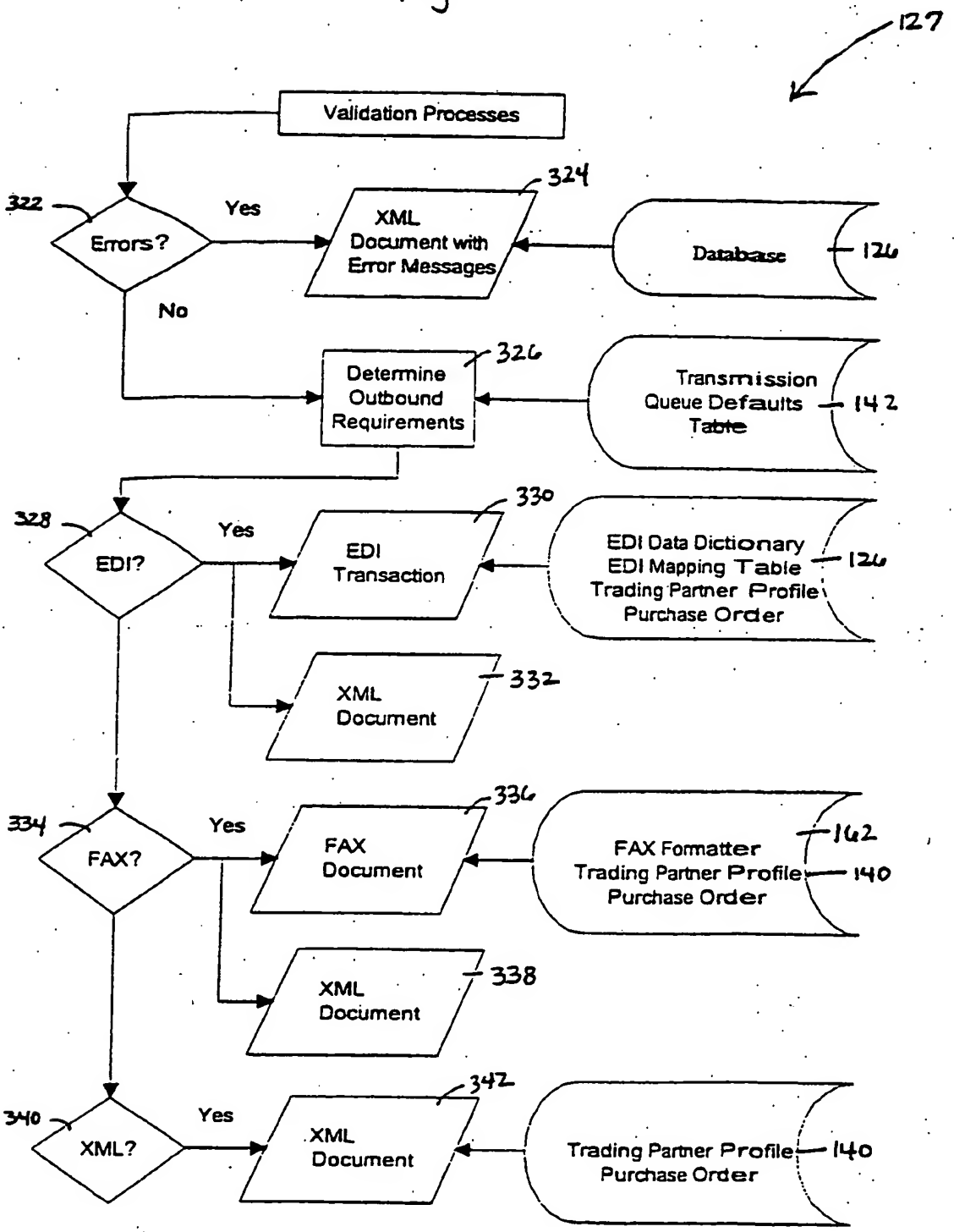
Fig. 9



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